Voice Controlled Robot using Bluetooth

A Project Report Submitted to

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

Towards the partial fulfillment of the Degree of

Bachelor of Engineering

in

Electronics and Telecommunication Engineering

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INDORE

RECOMMENDATION

This thesis entitled, **"Voice Controlled Robot using Bluetooth"**, submitted to the Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal, by **Rupesh Harode, Manoj Rajput, Sumit Sahu, Ajeet Singh, Palak Rajput** during the academic year **2018-2019** as a partial fulfillment for the award of the degree of **Bachelor of Engineering** in **Electronics and Telecommunication Engineering**, is a record of student's own work carried out by them under our direct supervision, in the **Department of Electronics and Telecommunication Engineering, S.G.S.I.T.S.** Indore.

The work contained in the thesis is a satisfactory account of his project work and is recommended for the award of the degree.

Prof. Manish Panchal **Prof. Mohit Khamele**

(Guide) **(Guide)**

Prof. Shekhar Sharma

(Head of Department)

Electronics and Telecommunication Engineering

SHRI G.S. INSTITUTE OF TECHNOLOGY AND SCIENCE, INDORE

CERTIFICATE

This is to certify that the thesis entitled **"Voice Controlled Robot using Bluetooth"**, submitted to the Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal, by **Rupesh Harode, Manoj Rajput, Sumit Sahu, Ajeet Singh, Palak Rajput** during the academic year **2018-2019**, is a record of their own work and is accepted in the partial fulfillment for the award of the degree of **Bachelor of Engineering** in **Electronics and Telecommunication Engineering**.

Internal Examiner **External Examiner**

Date: Date:

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ABSTRACT

Many of the wireless-controlled robots use RF modules. But this project make use of Android mobile phone for robotic control. The control commands available are more than RF modules. For this the android mobile user has to install an application on her/his mobile. Then user needs to turn on the Bluetooth in the mobile. The wireless communication techniques used to control the robot is Bluetooth technology. User can use various commands like move forward, reverse, move left, move right using these commands which are sent from the Android mobile. Robot has a Bluetooth receiver unit which receives the commands and give it to the microcontroller circuit to control the motors. The microcontroller then transmits the signal to the motor driver ICs to operate the motors.

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LIST OF ABBREVIATIONS

AC	**A**lternating **C**urrent
BT	**B**lue**T**ooth
DC	**D**irect **C**urrent
LED	**L**ight **E**mitting **D**iode
GSM	**G**lobal **S**ystem for **M**obile Communication

LIST OF SYMBOLS

C	Cipher Text
D	Dealer
D_K	Decryption Algorithm
E_K	Encryption Algorithm
g	Generator Polynomial Integer
$h(P)$	Hash Function
K_{AB}	Symmetric Key between A and B
K_A^{Pr}	Private Key Of Principle A
K_A^{Pu}	Public Key Of Principle A
$MAC_k(M)$	Message Authentication Code
N	Nonce a number to be used once
N_A	Nonce of a participant or principle
P	Plain Text
Pr	Probability
S	Secret
$SIG(M)$	Signature of message M
X_i	Input Plain text Stream
Y_i	Output Cipher text Stream
Z_i	Encryption key Stream
$\mathbf{k}$	Boltzman Constant

Chapter 1

Introduction

1.1 Overview

This project Voice Controlled Robotic Vehicle helps to control robot through voice commands received via android application. The integration of control unit with Bluetooth device is done to capture and read the voice commands. The robotic vehicle then operates as per the command received via android application. For this microcontroller is integrated in the system which makes it possible to operate the vehicle via android application. The controlling device may be any android-based Smartphone/tab etc. having an android OS. The android controlling system provides a good interactive GUI that makes it easy for the user to control the vehicle. The transmitter uses an android application required for transmitting the data. The receiver end reads these commands and interprets them into controlling the robotic vehicle. The android device sends commands to move the vehicle in forward, backward, right and left directions. After receiving the commands, the microcontroller then operates the motors I order to move the vehicle in four directions. The communication between android device and receiver is sent as serial communication data. The microcontroller program is designed to move the motor through a motor driver IC as per the commands sent by android device.

1.2 Purpose

The main purpose of this project is to develop a remote user interface to control a robot via a wireless technology. There is a need to communicate with the robot remotely in order to control the robot movements and pass critical data both ways. The current IR controls are not good enough because the robot does not have an IR transmitter but only a receiver, meaning that the communication is one way. The IR communication works only inline of direct sight and any objects in the way will obstruct the communication.Bluetooth communication will enable us to control the robot up to 100 meters without the need for direct sight which means that the robot could be located behind a wall or some other object and the communication would not be lost.

1.3 Advantages

The project aims in designing a Robot that can be operated using Android mobile phone. The controlling of the Robot is done wireless through Android smartphone using the Bluetooth feature present in it. Here in the project the Android smartphone is used as a remote control for operating the Robot. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android boasts a healthy array of connectivity options, including Wi-Fi, Bluetooth, and wireless data over a cellular connection (for example, GPRS, EDGE (Enhanced Data rates for GSM Evolution),and 3G). Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. In addition, Android includes a full set of tools that have been built from the ground up alongside the platform providing developers with high productivity and deep insight into their applications.Bluetooth is an open standard specification for a radio frequency (RF)-based, short range connectivity technology that promises to change the face of computing and wireless communication. It is designed to be an inexpensive, wireless networking system for all classes of portable devices, such as laptops, PDAs (personal digital assistants), and mobile phones. It also will enable wireless connections for desktop computers, making connections between monitors, printers, keyboards, and the CPU cable-free.The controlling device of the whole system is a Microcontroller. Bluetooth module,DC motors are

interfaced to the Microcontroller. The data received by the Bluetooth module from Android smart phone is fed as input to the controller. The controller acts accordingly on the DC motors of the Robot.

1.4 Features

The robot in the project can be made to move in all the four directions using the Android phone. The direction of the robot is indicated using LED indicators of the Robot system. In achieving the task the controller is loaded with a program written using Embedded C language.

Voice Commands for various movements-
1. **FORWARD** to move forward.
2. **BACKWARD** to move backward.
3. **LEFT** to move left.
4. **RIGHT** to move right.
5. **STOP** to stop the robot.

Chapter 2

Background

This section takes a brief look at Android smart phones and its features, how smartPhones will help to develop a community in the environment it is used in. Hardware,software and communication protocols are evaluated for their suitability to thisapplication. Finally, we take a brief look on existing systems.

2.1 Android Platform

Android devices are powerful mobile computers and they become more and more popular smart phones used worldwide. They becomes more and more popular for software developers because of its powerful capabilities and open architecture, also its based on the java programming language. Because Android uses the Java programming language getting started with the Android API is easy; the API is open and allows easy access to the hardware components. Android devices provide numerous communication interfaces like USB, Wi-Fi and Bluetooth, that can be used to connect to the robot. We think it is a great platform for a robotic system control,because its much cheaper than any other ARM-based processing unit. We use android platform because it is the widest used in the word and runs the largest number of Smartphones worldwide.

2.2 Connectivity and Communication

For the communication of the robot with the cell phone or a mobile we are using the Bluetooth device. The Bluetooth device (HC-05) is attached to the robot that receives the data from the mobile and also can transmit the data.Bluetooth: Bluetooth is a wireless communications protocol running at 2.4 GHz,with client-server architecture, suitable for forming personal area networks. It is designed for low power devices such as mobile phones [3,5].Bluetooth now comes as standard on the majority of mobile phones, and desktop computers. It can be easily fitted with a module to allow Bluetooth communication. Bluetooth is the only appropriate communications protocol because there is no fear of getting the frequency interference. Bluetooth uses the MAC Address of the device. The Bluetooth gives the connectivity between two devices using their MAC Address.

2.3 HC Serial Bluetooth

HC Serial Bluetooth product consists of Bluetooth serial interface module and Bluetooth adapter. Bluetooth serial module is used for converting serial port to Bluetooth. This module has two modes: master and slaver device. The device named after even number is defined to be master or slaver when out of factory and cant changed to the other mode. But for the device named after odd number, user scan set the work mode (master or slaver) of the device by AT commands. The main function of Bluetooth serial module is replacing the serial port line, such as:One connects to Bluetooth master device while the other one connect to slaver device. Their connection can be built once the pair is made. This Bluetooth connection is equivalently liked to a serial port line connection including RXD, TXD signals. And they can communicate with each other.

1. When MCU has Bluetooth salve module, it can communicate with Bluetooth adapter of computer and smart phones.
2. The Bluetooth devices in the market mostly are slave devices, such as Bluetooth printer, Bluetooth GPS. So, we can use master module to make pair and communicate with them.
3. Bluetooth serial modules operation doesnt need drive, and can communicate with the other Bluetooth device. But communication between two Bluetooth module require at two conditions:

i) The communication must be between master and slave.

ii) The password must be correct.

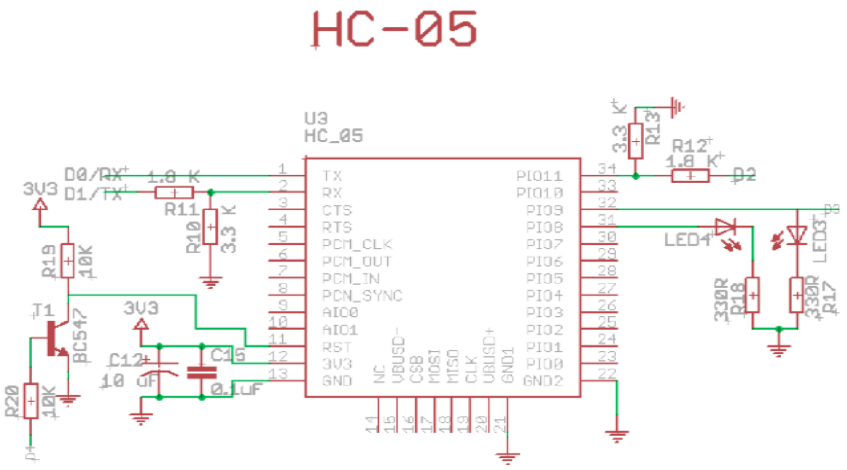


FIGURE 2.1: HC-05

2.4 Microcontroller

Micro controller is just like a small computer but the basic difference comes in size and memory. These have CPU, RAM, ROM, I/O and timers are all on a single chip. It means you dont need any extra device to make it functional like with a micro-processor. Generally this microcontroller is used where a specific task is needed to do. So fixed amount of on-chip ROM, RAM, and number of I/O ports makes them ideal for a many applications in which cost and space are critical The microcontroller is used by us in over project is AT89S52.

2.4.1 8051 8 Bit Microcontroller

8051 microcontroller, which acts as a processor. Nearly it consists of 40 pins. From these 40 pins, the inputs can be controlled by transmitting and receiving the inputs to the external device. It also consists of pulse width modulation (PWM). These PWM are used to transmit the entire signal in a pulse modulation. Input power supply such as Vcc and Gnd are used. These IC mainly consists of analog and digital inputs. These analog and digital inputs are used for the process of certain applications.

8051 microcontroller has been programmed for various applications. By using the power jack cable, microcontroller has been programmed so that the execution of the program may takes place. Various kinds of arduino board are present in the market. Microcontroller software is installed in the computer and so that we can edit and upload the program according to the applications. Mainly these microcontroller software supports c and c++ programming languages. Various inputs and outputs are present in the microcontroller board and therefore simultaneously 8 input and output ports can be used for various applications. Some of the applications used by using microcontroller boards are rotating general motor, stepper motor, control valve open, etc. The Operating Voltage is 5V, operating frequency of 8051 microcontroller is 11.0592 MHz.

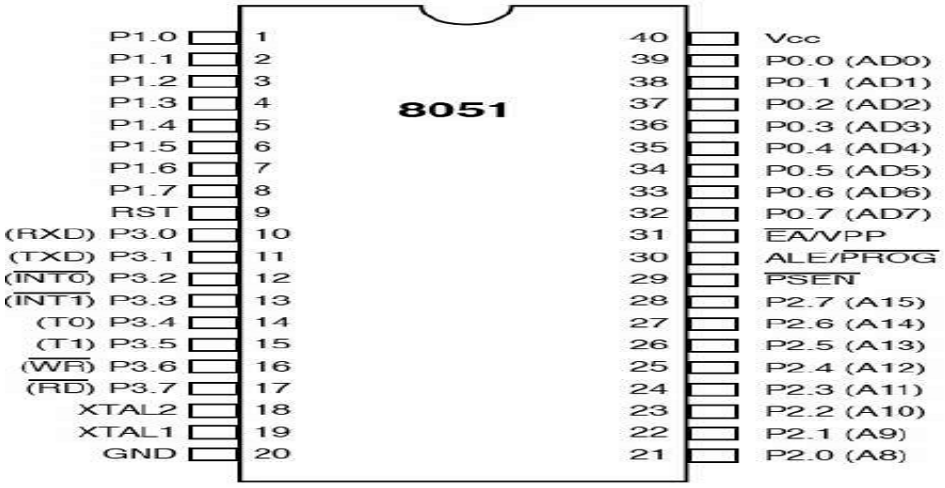


FIGURE 2.2: Pin out of 8051 Microcontroller

2.4.2 Pin Description

1. VCC - Digital supply voltage.

2. GND - Ground.

3. Port 1 (PB[7:0]) XTAL1/XTAL2/TOSC1/TOSC2 - Port B is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port B output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port B pins that are externally pulled low will source current if the pull-up resistors are activated. The Port B pins are tri-stated when a reset condition becomes active, even if the clock is not running. Depending on the clock selection fuse settings, PB6 can be used as input to the inverting Oscillator amplifier and input to the internal clock operating circuit.

Depending on the clock selection fuse settings, PB7 can be used as output from the inverting Oscillator amplifier. If the Internal Calibrated RC Oscillator is used as chip clock source, PB[7:6] is used as TOSC[2:1] input for the Asynchronous Timer/Counter2 if the AS2 bit in ASSR is set.

4. Port 2 (PC[5:0]) - Port C is a 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The PC[5:0] output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs,Port C pins that are externally pulled low will source current if the pull-up resistors are activated. The Port C pins are tri-stated when a reset condition becomes active, even if the clock is not running.

5. PC6/RESET - If the RSTDISBL Fuse is programmed, PC6 is used as an I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of Port C.If the RSTDISBL Fuse is unprogrammed, PC6 is used as a Reset input. A low level on this pin for longer than the minimum pulse length will generate a Reset, even if the clock is not running. Shorter pulses arenot guaranteed to generate a Reset.The various special features of Port C are elaborated in the Alternate Functions of Port C section.

6. Port 3 (PD[7:0]) - Port D is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port D output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs,Port 3 pins that are externally pulled low will source current if the pull-up resistors are activated. The Port D pins are tri-stated when a reset condition becomes active, even if the clock is not running.

7. AVCC - AVCC is the supply voltage pin for the A/D Converter, PC[3:0], and PE[3:2]. It should be externally connected to VCC, even if the ADC is not used. If the ADC is used, it should be connected to VCC through a low-pass filter. Note that PC[6:4] use digital supply voltage, VCC.

8. AREF - AREF is the analog reference pin for the A/D Converter.

9. ADC[7:6] (TQFP and VFQFN Package Only) - In the TQFP and VFQFN package, ADC serve as analog inputs to the A/D converter. These pins are powered from the analog supply and serve as 10-bit ADC channels.

2.5 Motor driver circuit

The pin 8 of IC should be connected to the 9v battery or 12v.This pin8 is internally connected to the driver circuit inside the IC which helps the motor to get the good supply which also helps the smooth functioning of motors.

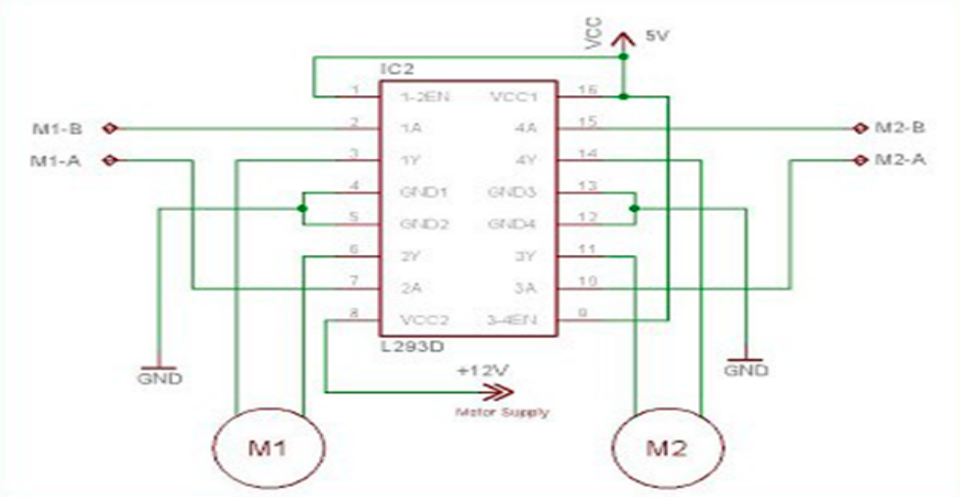


FIGURE 2.3: Motor Driver Circuit

2.6 DC Motor

Almost every mechanical movement that we see around us is accomplished by an electric motor. Electric machines are means of converting energy. Motors take electrical energy and produce mechanical energy. Electric motor is used to power hundreds of devices we use in everyday life. An example of small motor applications includes motors used in automobiles, robot, hand power tools and food blenders. Micro-machines are electric machines with parts the size of red blood cells and find many applications in medicine.

2.7 UART

Universal asynchronous receiver/ transmitter is usually an individual integrated circuit used for serial communications over a computer or peripheral device serial port. UART are now commonly included in microcontrollers. A dual UART

combines two UARTS into a single chip. Many modern ICs come with a UART that can also communicate synchronously; these devices are called UART.

Chapter 3

Problem Formulation

3.1 Objective

To build a Voice controlled Robot using Bluetooth programmed which is made using microcontroller 8051.

3.2 Problem Statement

Cars are controlled manually and requires involvement of human for driving and handling. Although, we can not completely rely on concepts of driver-less cars due to risk involved but we can use technology to simplify basic movements. Voice instructions can be used to park cars.

3.3 Challenges

3.3.1 Hardware Challenge

1. Fit all the hardware components in the chassis so that the no hardware comes in the way of movement of vehicle.
2. Minimize all the fluctuations and noise coming in the signal so that the program works correctly for all outputs.
3. Using enough battery supply to feed the bluetooth module.

3.3.2 Programming Challenge

1. To program the micro-controller to receive instructions from Bluetooth Module and transmit instructions to motor driver.
2. To read ASCII characters received from Bluetooth module and send binary output for motor drivers.
3. Communicate the Bluetooth module with mobile Android application for receiving voice signals.

Chapter 4

Proposed Methodology

4.1 Proposed Work

We have used a Bluetooth module to control the robot via 2BO motors at 300RPM approx the robot is control by an android phone application Microcontroller used is AT89S51 from 8051 family to work in a serial communication UART mode the communication is configured on 9800bps to communicate it with the Bluetooth module.The Bluetooth module used is a HC-05 in smd package which works on a3.3v and have a serial communication with any device connected to it the communication speed can be configured on various speed via AT Command.The BT module is a SPP supported profile so it can be connected easily to any module or phone. In this profile the data can be sent and receive to module. The BT module is connected to the RX pin of microcontroller.The L293D is a motor driver IC to operate the motors in any direction required dependent on the logic applied to the logic pins.

A ready made compact size chassis is used to avoid the chassis assembly .The chassis contains 2 decks. The lower is used for BO motors fitting. The upper is used as a battery stack .On top the plate the board is mounted by screw fitting.

4.2 Applications

Apart from helping swimmers to gear up their speed, this overall system can be useful in the monitoring purposes, searching operations, to make paths underwater

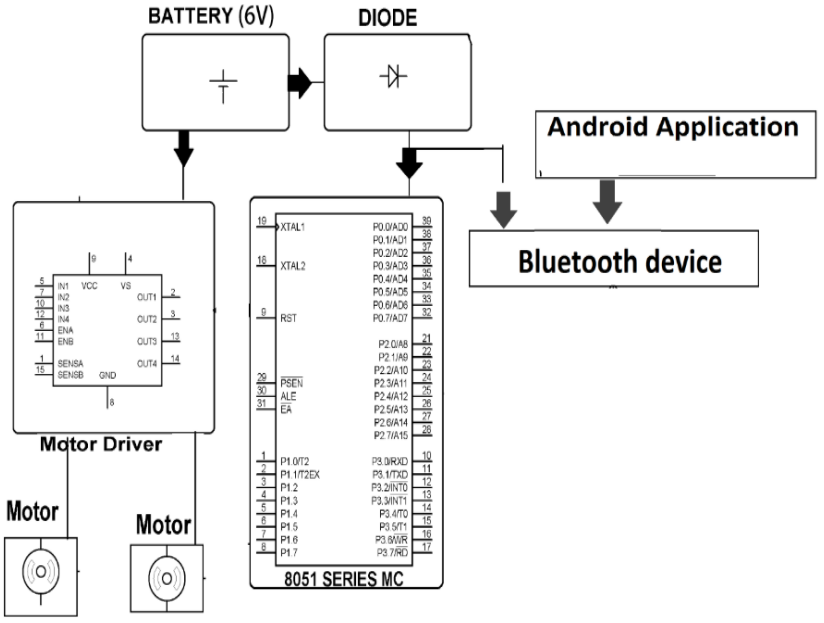


FIGURE 4.1: Block Diagram

and to observe and monitor diiferent different parameters. It can also be helpful in underwater sports to ensure zero casuality it can be helpful by applying different sensors it can be used for many purposes.

Chapter 5

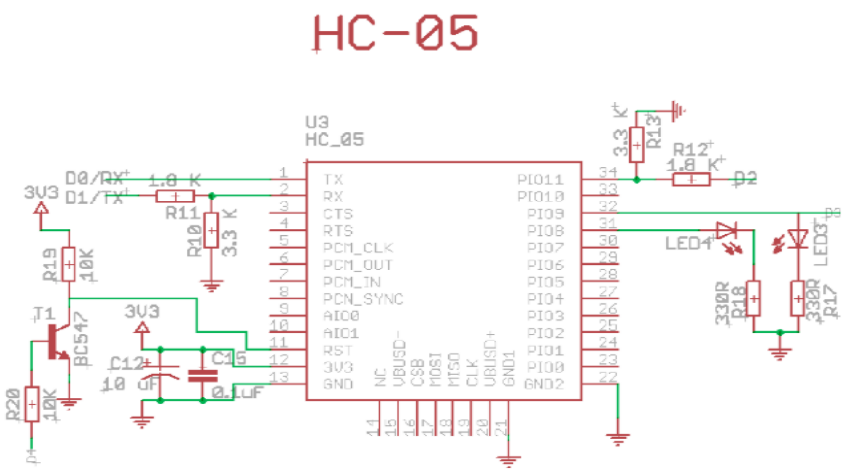
Hardware Implementation

5.1 Components Used

1. HC Serial Bluetooth
2. Microcontroller 8051
3. Motor Driver Circuit
4. DC Motor
5. UART

5.1.1 HC Serial Bluetooth

HC Serial Bluetooth product consists of Bluetooth serial interface module and Bluetooth adapter. Bluetooth serial module is used for converting serial port to Bluetooth. This module has two modes: master and slaver device. The device named after even number is defined to be master or slaver when out of factory and cant changed to the other mode. But for the device named after odd number, user scan set the work mode (master or slaver) of the device by AT commands. The main function of Bluetooth serial module is replacing the serial port line, such as:One connects to Bluetooth master device while the other one connect to slaver device. Their connection can be built once the pair is made. This Bluetooth connection is equivalently liked to a serial port line connection including RXD, TXD signals. And they can communicate with each other.



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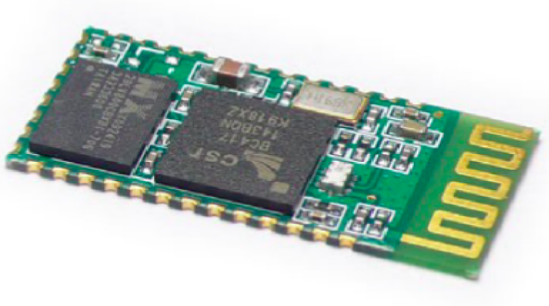

FIGURE 5.2: Bluetooth Module

5.1.2 Micro Controller 8051

Basic Pins PIN 9: PIN 9 is the reset pin which is used reset the microcontrollers internal registers and ports upon starting up. (Pin should be held high for 2 machine cycles.) PINS 18 19: The 8051 has a built-in oscillator amplifier hence we need to only connect a crystal at these pins to provide clock pulses to the circuit. PIN 40 and 20: Pins 40 and 20 are VCC and ground respectively. The 8051 chip needs +5V 500mA to function properly, although there are lower powered versions like the Atmel 2051 which is a scaled down version of the 8051 which runs on +3V. PINS 29, 30 31: As described in the features of the 8051, this chip contains a built-in flash memory. In order to program this we need to supply a voltage of +12V at pin 31. If external memory is connected then PIN 31, also called EA/VPP, should be connected to ground to indicate the presence of external memory. PIN 30 is called ALE (address latch enable), which is used when multiple memory chips are connected to the controller and only one of them needs to be selected. We will deal with this in depth in the later chapters. PIN 29 is called PSEN. This is "program store enable". In order to use the external memory it is required to provide the low voltage (0) on both PSEN and EA pins.

Ports There are 4 8-bit ports: P0, P1, P2 and P3. PORT P1 (Pins 1 to 8): The port P1 is a general purpose input/output port which can be used for a variety of interfacing tasks. The other ports P0, P2 and P3 have dual roles or additional functions associated with them based upon the context of their usage. PORT P3 (Pins 10 to 17): PORT P3 acts as a normal IO port, but Port P3 has additional functions such as, serial transmit and receive pins, 2 external interrupt pins, 2 external counter inputs, read and write pins for memory access. PORT P2 (pins 21 to 28): PORT P2 can also be used as a general purpose 8 bit port when no external memory is present, but if external memory access is required then PORT P2 will act as an address bus in conjunction with PORT P0 to access external memory. PORT P2 acts as A8-A15, as can be seen from PORT P0 (pins 32 to 39) PORT P0 can be used as a general purpose 8 bit port when no external memory is present, but if external memory access is required then PORT P0 acts as a multiplexed address and data bus that can be used to access external memory in conjunction with PORT P2. P0 acts as AD0-AD7, as can be seen from.

Oscillator Circuits The 8051 requires the existence of an external oscillator circuit. The oscillator circuit usually runs around 12MHz, although the 8051

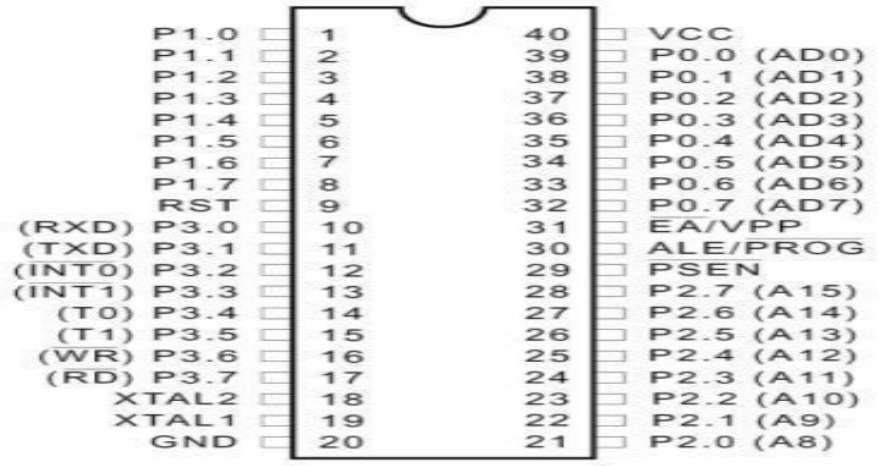

FIGURE 5.3: Pin Diagram

(depending on which specific model) is capable of running at a maximum of 40MHz. Each machine cycle in the 8051 is 12 clock cycles, giving an effective cycle rate at 1MHz (for a 12MHz clock) to 3.33MHz (for the maximum 40MHz clock). The oscillator circuit that generates the clock pulses so that all internal operations are synchronized.

Data and Program Memory The 8051 Microcontroller can be programmed in PL/M, 8051 Assembly, C and a number of other high-level languages. Many compilers even have support for compiling C++ for an 8051. Program memory in the 8051 is read-only, while the data memory is considered to be read/write accessible. When stored on EEPROM or Flash, the program memory can be rewritten when the microcontroller is in the special programmer circuit.

Program Start Address The 8051 starts executing program instructions from address 0000 in the program memory.

Direct Memory The 8051 has 256 bytes of internal addressable RAM, although only the first 128 bytes are available for general use by the programmer. The first 128 bytes of RAM (from 0x00 to 0x7F) are called the Direct Memory, and can be used to store data.

Special Function Register The Special Function Register (SFR) is the upper area of addressable memory, from address 0x80 to 0xFF. A, B, PSW, DPTR are called SFR. This area of memory cannot be used for data or program storage, but is instead a series of memory-mapped ports and registers. All port input and output can therefore be performed by memory mov operations on specified

addresses in the SFR. Also, different status registers are mapped into the SFR, for use in checking the status of the 8051, and changing some operational parameters of the 8051.

General Purpose Registers The 8051 has 4 selectable banks of 8 addressable 8-bit registers, R0 to R7. This means that there are essentially 32 available general purpose registers, although only 8 (one bank) can be directly accessed at a time. To access the other banks, we need to change the current bank number in the flag status register.

A and B Registers The A register is located in the SFR memory location 0xE0. The A register works in a similar fashion to the AX register of x86 processors. The A register is called the accumulator, and by default it receives the result of all arithmetic operations. The B register is used in a similar manner, except that it can receive the extended answers from the multiply and divide operations. When not being used for multiplication and Division, the B register is available as an extra general-purpose register.

5.1.3 Motor driver circuit

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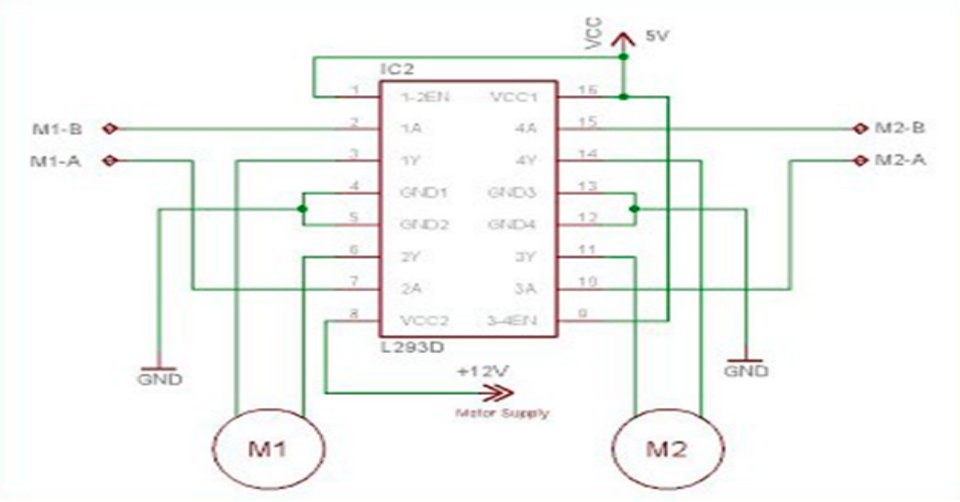

FIGURE 5.4: Motor Driver Circuit

5.1.4 DC Motor

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Chapter 6

Software Used

6.0.1 Eagle

EAGLE is a scriptable electronic design automation (EDA) application with schematic capture, printed circuit board (PCB) layout, auto-router and computer-aided manufacturing (CAM) features. EAGLE stands for Easily Applicable Graphical Layout Editor (German: Einfach Anzuwendender Grafischer Layout-Editor) and is developed by CadSoft Computer GmbH.EAGLE contains a schematic editor, for designing circuit diagrams. Schematics are stored in files with .SCH extension, parts are defined in device libraries with .LBR extension. Parts can be placed on many sheets and connected together through ports.

The PCB layout editor stores board files with the extension .BRD. It allows back-annotation to the schematic and auto-routing to automatically connect traces based on the connections defined in the schematic.

EAGLE saves Gerber and PostScript layout files as well as Excellon and Sieb Meyer drill files. These are standard file formats accepted by PCB fabrication companies, but given EAGLE's typical user base of small design firms and hobbyists, many PCB fabricators and assembly shops also accept EAGLE board files (with extension .BRD) directly to export optimized production files and pick-and-place data themselves.

EAGLE provides a multi-window graphical user interface and menu system for editing, project management and to customize the interface and design

parameters. The system can be controlled via mouse, keyboard hotkeys or by entering specific commands at an embedded command line. Multiple repeating commands can be combined into script files (with file extension .SCR). It is also possible to explore design files utilizing an EAGLE-specific object-oriented programming language (with extension .ULP).

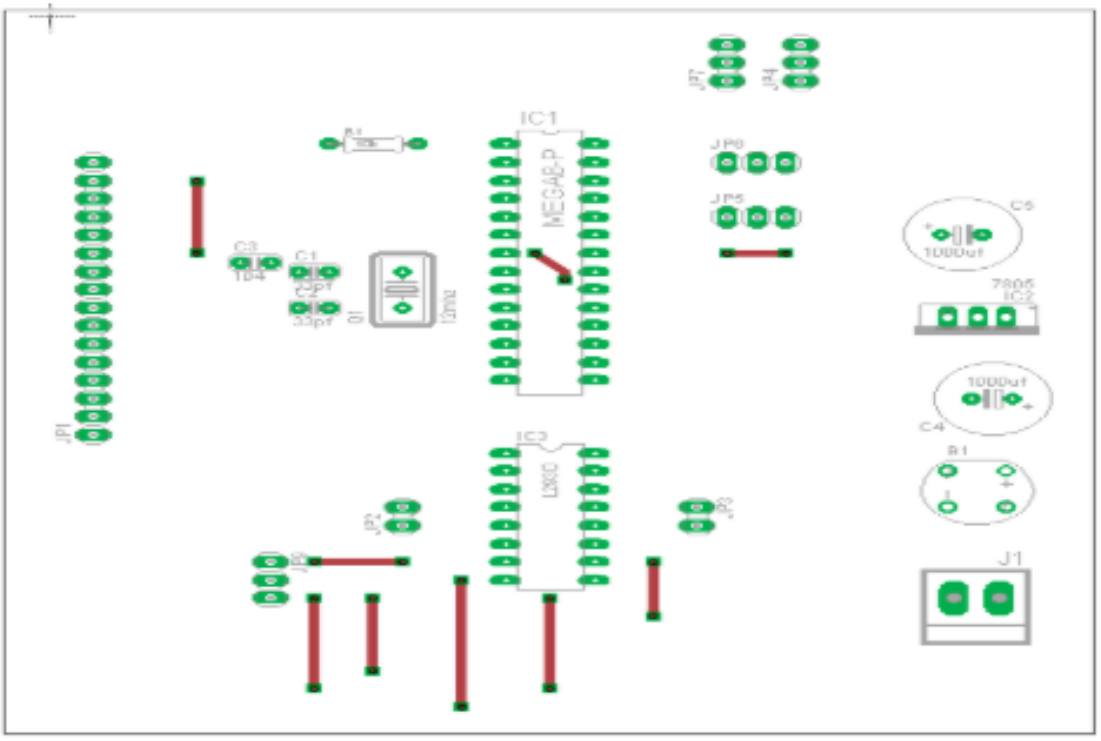

FIGURE 6.1: PCB Designing.

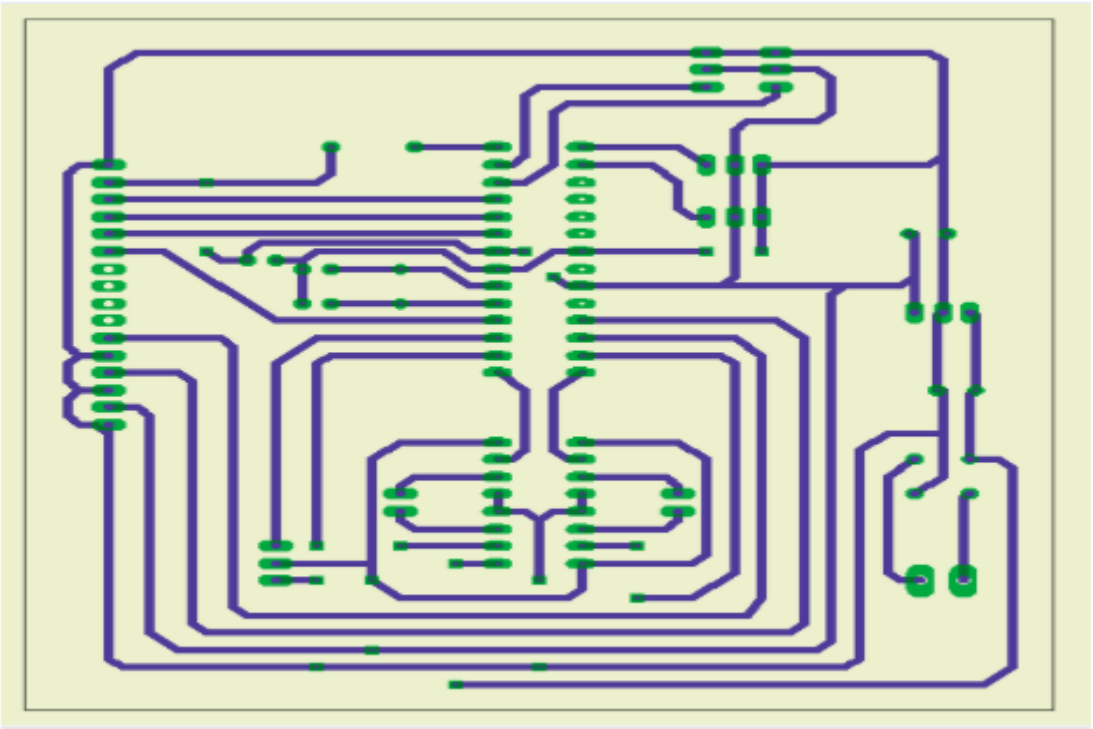

FIGURE 6.2: PCB Layout.

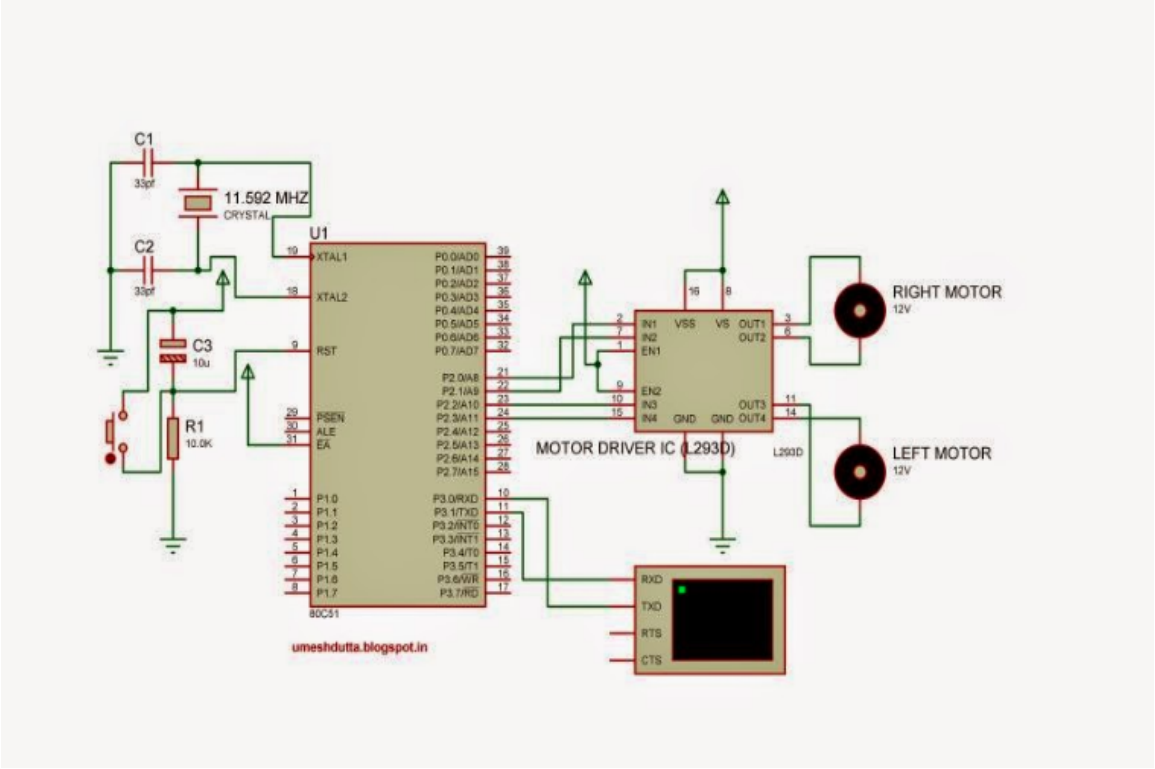

FIGURE 6.3: Schematic View.

6.0.2 Microcontroller Program

```
#include<reg51.h>
#define a P2


void main()
{
unsigned int x ;
a =0xff;
SCON = 0x50;
TMOD=0X20;
TH1=0Xfd;
TR1=1;
while(1)
{
while(RI==0);
x=SBUF;
RI=0;

if(x==0x46)
{a=0x0a;}

if(x==0x42)
{a=0x05;}

if(x==0x4c)
{a=0x06;}

if(x==0x52)
{a=0x09;}

if(x==0x53)
{a=0x00;}//
```

```
}
}
```

Chapter 7

Conclusion

7.1 Future Scope

This project will be further implemented on platform like AVR, ARM microcontroller etc.More can be done in the process of UART communication control and many challenges will be carry out to increase reliability and efficiency.This system also can be developed by using GSM technology. The knowledge is ever expanding and so are the problems which the mankind strive to solve. In this spirit, it is hoped that the current activity will lead to further enhancements.For example; work on future for military purpose by therobot.

7.2 Conclusion

Wireless control is one of the most important basic needs for all living beings. But unfortunately due to a huge amount of data and communication overheads the technology is not fully utilized. 1 Many of the wireless-controlled robots use RF modules. But this project make use of Android mobile phone for robotic control which is very cheap and easily available. The control commands available are more than RF modules. For this the android mobile user has to install an application on her/his mobile. Then user needs to turn on the Bluetooth in the mobile. The wireless communication techniques used to control the robot is Bluetooth technology. User can use various commands like move forward, reverse, move left, move right using these commands which are sent from the Android mobile.

Robot has a Bluetooth receiver unit which receives the commands and give it to the microcontroller circuit to control the motors. The microcontroller then transmits the signal to the motor driver ICs to operate the motors The objective of the paper is to realize the smart living ,more specifically the home lighting control system using Bluetooth Technology. Robot and smart phones are a perfect match, specially mobile robots. As phones and mobile devices are each time more powerful, using them as robot for building robot with advanced feature such as voice recognition. Android bluetooth-enable phones and bluetooth module via HC-06 and communication among bluetooth devices. It is concluded that smart living will gradually turn into a reality that consumer can control their home remotely and wirelessly.

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